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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,838	11/14/2001	David Carroll	AIREX 00.01	3024

7590 11/21/2002

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EXAMINER

LAM, THANH

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 11/21/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/990,838

Applicant(s)
Carroll et al.

Examiner
Thanh Lam

Art Unit
2834



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 3 6) ☐ Other:

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Maurio et al.

Maurio et al. disclose an integrated motor and magnetic bearing, comprising: a rotor (12) comprising a plurality of permanent magnets (14); and a stator comprising a plurality of independently controlled coil segments (18a-18d) magnetically coupled to said permanent magnets.

Regarding claim 2, Maurio et al. disclose said coil segments comprising a plurality of coil phases.

Regarding claim 3, Maurio et al. disclose a first radial position sensor (22) disposed in or adjacent to a clearance gap between said rotor and said stator for sensing the position of said rotor with respect to said stator along a first axis, and a second radial position sensor (24) disposed in or adjacent to said clearance gap between said rotor and said stator for sensing the position of said rotor with respect to said stator along a second axis.

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Regarding claim 4, Mauro et al. disclose said integrated motor and magnetic bearing capable of providing simultaneously both rotational torque and radial bearing force.

Regarding claim 5, Mauro et al. disclose said integrated motor and magnetic bearing permitting dynamic application of rotational torque and/or radial force.

Regarding claim 6, Mauro et al. disclose said integrated motor and magnetic bearing capable of providing rotational torque and/or radial bearing force.

Regarding claim 7, Mauro et al. disclose at least one said sensor is selected from the group consisting of an encoder, a Hall effect transistor, and a device adapted to measure a voltage generated at at least one said coil segment.

Regarding claim 8, Mauro et al. disclose said integrated motor and magnetic bearing operating as a DC device.

Regarding claim 9, Mauro et al. disclose said clearance gap is sized so as to provide vibration isolation.

Regarding claim 10, Mauro et al. disclose at least one redundant coil segment is provided for fault tolerance. 11. said integrated motor and magnetic bearing is adapted to provide off axis-operation and/or run-out cancellation.

Regarding claim 12, Mauro et al. disclose a controller receiving input from at least one said sensor and, based on said at least one input, controlling the current delivered to at least one said coil segment.

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Regarding claim 13, Mauro et al. disclose said controller is adapted to permit off-axis positioning.

Regarding claim 14, Mauro et al. disclose said rotor has a toothless configuration.

Regarding claim 15, Mauro et al. disclose a thrust bearing adapted to provide axial thrust.

Regarding claim 16, Mauro et al. disclose said rotor and said stator are configured such that the attraction of said rotor to said stator provides axial thrust.

Regarding claim 17, Mauro et al. disclose said plurality of coil segments is at least three coil segments.

Regarding claim 18, Mauro et al. disclose said plurality of coil phases is at least two coil phases.

Regarding claim 19, Mauro et al. disclose An apparatus for manipulating a shaft comprising: two integrated motor and magnetic bearing assemblies, each said assembly comprising a rotor and a stator, each said rotor comprising a plurality of permanent magnets, and each said stator comprising a plurality of independently controlled coil segments magnetically coupled to said permanent magnets; and a shaft; wherein each said assembly is disposed along said shaft.

Regarding claim 20, Mauro et al. disclose an independent control device for each said assembly, thereby allowing independent movement of the shaft with respect to each said assembly.

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Regarding claim 21, Mauro et al. disclose An apparatus as claimed in claim 20, wherein said control devices are adapted to permit warping or off-axis pointing through the axial plane by independent positioning of the suspended shaft in each said assembly.

Regarding claim 22, Mauro et al. disclose said control devices are adapted to permit rotation of said shaft off the central axis.

Regarding claim 23, Mauro et al. disclose a thrust bearing adapted to provide axial thrust.

Regarding claim 24, Mauro et al. disclose. at least one said rotor and at least one said stator are configured such that the attraction of said rotor to said stator provides axial thrust.

Regarding claim 25, the apparatus of Mauro et al. Anticipate the method for providing integral electromagnetic motor and bearing functions comprising: sensing a first radial position of a rotor, said rotor comprising a plurality of permanent magnets, with respect to a stator along a first axis, said stator comprising a plurality of independently controlled coil segments magnetically coupled to said permanent magnets; sensing a second radial position of said rotor with respect to said stator along a second axis; and delivering current to at least one said coil segment, the amount of said current based on at least one said sensed position.

Regarding claim 26, the apparatus of Mauro et al. anticipate the method as claimed in claim 25, further comprising providing axial thrust along a third axis, said third axis crossing the plane of said first and said second axes.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Lam whose telephone number is (703) 308-7626. The fax phone number for this Group is (703) 305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0656.

A handwritten signature in black ink, appearing to read 'Thanh Lam', with a stylized, flowing script.

Thanh Lam

Patent Examiner